

SUBJECT: *Arbor Hills Landfill GMAP H₂S/CH₄ Air Monitoring*

PREPARED BY: Marta Fuoco *MF 03/22/16*
Physical Scientist
Air Monitoring and Analysis Section

**FIELD MONITORING
CONDUCTED BY:** Scott Hamilton
Physical Scientist
Air Monitoring and Analysis Section

Bilal Qazzaz
Physical Scientist
Air Monitoring and Analysis Section

**FIELD MONITORING
REQUESTED BY:** Kenneth Ruffatto
Environmental Engineer
Air Enforcement and Compliance Assurance, IL/IN Section

**DATES OF FIELD
MONITORING:** February 16-17, 2016

REPORT AUTHORIZED BY:

Michael Compher 3/22/16
Michael Compher
Supervisor
Air Monitoring and Analysis Section

March 22, 2016

USEPA R5 monitored to evaluate the ambient air concentrations of hydrogen sulfide (H₂S) and methane (CH₄) near Arbor Hills Landfill on February 16-17, 2016. On 02/16/16, observed conditions were 5-10 mph WNW winds with a low ceiling; 5-10 mph NNW winds and sunny skies on 02/17/16.

Region 5's Geospatial Monitoring of Air Pollution (GMAP) uses a Picarro G2204 cavity ringdown spectroscopy (CRDS) analyzer, SN 2267-BFADS2013. The data are integrated with global positioning system location information and meteorological parameters when available to quantify air pollutant concentrations. Additional information can be found in the SOP and March 26, 2015 Quality Assurance Project Plan (GMAP SOP R5-ARD-0002-r1; QAPP V2 0 2015-03-25). For short term H₂S air monitoring data, the monitored concentrations are frequently compared to ATSDR's acute inhalation Minimal Risk Level (MRL) of 70 ppb (ATSDR 2006) or other state or local levels. CH₄ concentrations are frequently compared to ATSDR's *de minimis* level for screening purposes of soil gas concentration, 1.25% (12,500 ppm) or other state or local levels. VOC concentrations are often used as a surrogate for other volatile organic compounds (VOCs) in evaluating the need for additional VOC air monitoring.

Measurements were taken over two days, February 16-17, 2016. Table 1 depicts maximum 1 second measured concentrations of H₂S (81.9 ppb) and CH₄ (100.9 ppm). Table 2 depicts concentration vs time. The subsequent satellite images depict the H₂S and CH₄ concentrations spatially.

Concentrations above the detection limit of H₂S and CH₄ were measured on the face of the landfill and outside the fenceline of the facility; the maximum H₂S concentration of 81.9 ppb monitored on February 16 at 42.404306, -83.550220 exceeds ATSDR's acute minimal risk level (MRL) of 70 ppb, indicating a potential acute human health hazard. The CH₄ maximum value of 100.9 ppm was found to be below ATSDR's *de minimis* level for screening purposes of 1.25% (12,500 ppm) for soil gas concentrations.

Table 1: Maximum Values

12/17/15 Arbor Hills Landfill	Max
H ₂ S (ppb)	81.9
CH ₄ (ppm)	100.9

March 22, 2016

Arbor Hills Landfill 02/16-17/2016

Y-axis (Left): H₂S (ppb)

Y-axis (Right): CH₄ (ppm)

X-axis: Time (UTM)

Legend: H₂S (ppb) (Blue line), CH₄ (ppm) (Orange line)

Time (UTM)	H ₂ S (ppb)	CH ₄ (ppm)
7:47:50 PM	10	0
7:53:45 PM	15	0
7:59:36 PM	12	0
8:05:28 PM	10	0
8:11:16 PM	12	0
8:17:04 PM	10	0
8:22:52 PM	15	0
8:28:40 PM	25	0
8:34:27 PM	28	0
8:40:15 PM	25	0
8:46:03 PM	15	0
8:51:50 PM	15	0
8:57:38 PM	10	0
9:03:25 PM	10	0
9:09:12 PM	15	0
9:14:59 PM	10	0
9:20:46 PM	10	0
9:26:34 PM	10	0
9:32:21 PM	10	0
9:38:09 PM	35	0
9:43:56 PM	10	0
9:49:44 PM	10	0
9:55:31 PM	10	0
10:01:19 PM	10	0
10:07:06 PM	10	0
10:12:54 PM	10	0
10:18:41 PM	10	0
10:24:29 PM	10	0
10:30:16 PM	10	0
10:36:04 PM	10	0
10:41:51 PM	10	0
10:47:39 PM	10	0
10:53:26 PM	10	0
10:59:14 PM	10	0
11:05:01 PM	10	0
11:10:49 PM	10	0
11:16:36 PM	10	0
11:22:24 PM	10	0
11:28:11 PM	10	0
11:34:00 PM	10	0
11:39:47 PM	10	0
11:45:35 PM	10	0
11:51:22 PM	10	0
11:57:10 PM	10	0
12:02:57 PM	10	0
12:08:45 PM	10	0
12:14:32 PM	10	0
12:20:20 PM	10	0
12:26:07 PM	10	0
12:31:55 PM	10	0
12:37:42 PM	10	0
12:43:30 PM	10	0
12:49:17 PM	10	0
12:55:05 PM	10	0
13:00:52 PM	10	0
13:06:40 PM	10	0
13:12:27 PM	10	0
13:18:15 PM	10	0
13:24:02 PM	10	0
13:29:50 PM	10	0
13:35:37 PM	10	0
13:41:25 PM	10	0
13:47:12 PM	10	0
13:53:00 PM	10	0
13:58:47 PM	10	0
14:04:35 PM	10	0
14:10:22 PM	10	0
14:16:10 PM	10	0
14:21:57 PM	10	0
14:27:45 PM	10	0
14:33:32 PM	10	0
14:39:20 PM	10	0
14:45:07 PM	10	0
14:50:55 PM	10	0
14:56:42 PM	10	0
15:02:30 PM	10	0
15:08:17 PM	10	0
15:14:05 PM	10	0
15:19:52 PM	10	0
15:25:40 PM	10	0
15:31:27 PM	10	0
15:37:15 PM	10	0
15:43:02 PM	10	0
15:48:50 PM	10	0
15:54:37 PM	10	0
16:00:25 PM	10	0
16:06:12 PM	10	0
16:12:00 PM	10	0
16:17:47 PM	10	0
16:23:35 PM	10	0
16:29:22 PM	10	0
16:35:10 PM	10	0
16:40:97 PM	10	0
16:46:85 PM	10	0
16:52:72 PM	10	0
16:58:60 PM	10	0
17:04:47 PM	10	0
17:10:35 PM	10	0
17:16:22 PM	10	0
17:22:10 PM	10	0
17:27:57 PM	10	0
17:33:45 PM		



Arbor Hills Landfill GMAP H₂S and CH₄ Air Monitoring

March 22, 2016

